DeAnza College H. Bourgoub

Calculator Basics IV

Exploring the general equation of a Parabola

The effect of the lead coefficient a on the graph of $f(x) = ax^2 + bx + c$

To produce a family of graphs for specific parabola by varying the values of the lead coefficient, use the LIST function to supply the values of a.

For example

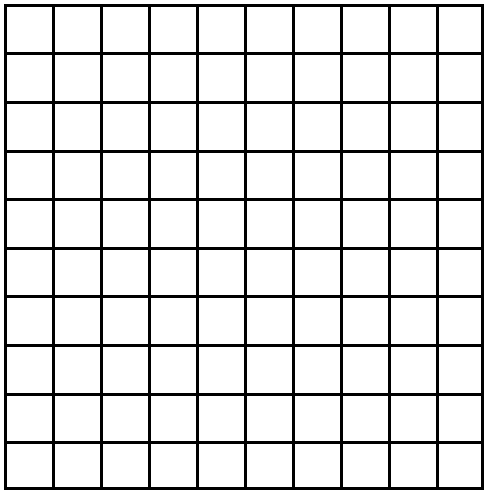
To explore the graphs of $f(x) = ax^2 + 3x - 2$, try the following:

Enter $y_1 = \{1,2,3,4,5\}x^2 + 3x + -2$ in the graph editor

Graphing the above equation will produce five graphs, one for each value of the list. One graph for each a=1, a=2, and so on.

Exercise

Produce the graphs of $f(x) = ax^2 + 3x - 2$ For a=0.1, 0.4 ,0.6, 0.8, 1.5, 2.0, 3.0 on the same coordinate axes then describe the affect of the parameter a on the graph of the parabola.



For the effect of the parameters c, replace y_1 with,

$$y_1 = x^2 + 3x + \{1,2,3,-1,-2,-3\}$$

and for the effect of b replace y_1 with,

$$y_1 = x^2 + \{1,2,3,-1,-2,-3\}x + 1$$